Jules Howard-Wright
Transmit Consultancy Ltd.
Chief Executive

October 31, 2013

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions; Docket No. 12-268 and Public Notice: Media Bureau Seeks Comment on Catalog of Eligible Expenses and Other Issues Related to the Reimbursement of Broadcaster Channel Reassignment Costs, September 23, 2013, DA 13-1954

Dear Ms Dortch,

Transmit Consultancy Ltd. herewith transmits its comments in the captioned proceeding, relating specifically to management of the incentive auction for broadcaster channel reassignment.

We would welcome the opportunity to discuss our comments with the FCC, broadcasters and other interested parties.

Yours sincerely,

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Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Expanding the Economic and Innovation	)	Docket No. 12-268
Opportunities of Spectrum Through	)	
Incentive Auctions	)	

To: The Commission

Comments of Transmit Consultancy Ltd.

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November 4, 2013

Summary

Transmit Consultancy Ltd.'s ("Transmit") comments are based upon its recent experience of managing two repacking exercises in the United Kingdom and involvement with other European spectrum changes. Transmit recognizes that not all UK and European experience may be directly transferable to the U.S. context but there are a number of areas where the parallels are strong enough to suggest that the approaches developed and lessons learned could be taken into consideration. Transmit presents its experience for consideration.

Transmit's experience with repacking exercises in the UK and in other European countries can inform the approach in the upcoming repack to accommodate 700 MHz wireless broadband auction winners. Based on this experience, Transmit believes that, as in past U.S. spectrum realignment proceedings, centrally managed – but consensus based – coordination is essential in light of the complex goals, and applicable limitations, of the incentive auctions. Specifically, a single-purpose organization operating within a framework established by the Commission would facilitate consolidated, central management for repacking that is coordinated by the Industry itself. The benefits of Industry coordination in this type of framework include:

- Maximizing the benefit to the public by meeting the spectrum goals in a timely manner;
- Minimizing any disruptive impact on the TV-viewing public and harm to participating broadcasters;
- Reducing relocation costs through efficient management; and
- Avoiding waste, fraud, and abuse.

The public interest will best be served by enabling participating broadcasters to minimize the impact of disruptive events on their businesses and to participate in the repacking process in a commercially sophisticated manner.

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To: The Commission

Comments of Transmit Consultancy Ltd.

Transmit Consultancy Ltd. ("Transmit") submits its comments in the captioned proceeding, specifically relating to issues arising in connection with broadcaster channel reassignment, or repacking, including reimbursement of costs. Transmit's experience with repacking exercises in the United Kingdom ("UK") and in other European countries can inform the approach in the upcoming repack to accommodate 700 MHz wireless broadband auction winners. Based on this experience, Transmit believes that centrally managed – but consensus based – coordination is essential in light of the complex goals, and applicable limitations, of the incentive auctions. Specifically, a single-purpose organization operating within a Commission-established framework would facilitate consolidated, central management for repacking that is coordinated by the Industry itself. The benefits of Industry coordination in this type of framework include:

- Maximizing the benefit to the public by meeting the spectrum goals in a timely manner;
- Minimizing any disruptive impact on the TV-viewing public and harm to participating broadcasters;
- Reducing relocation costs through efficient management; and
- Avoiding waste, fraud, and abuse.

The public interest will best be served by enabling participating broadcasters to minimize the impact of this potentially disruptive event on their businesses and to participate in the repacking process in a commercially sophisticated manner. Transmit assisted the UK repacking its broadcasters in a similar relocation.

In the UK Transmit assisted the 2nd broadcaster repack. The repack was financed by the Government. It reimbursed broadcasters for costs incurred by them to complete the repack; the fund being administrated and managed by the regulator (Ofcom). The 1st repack was financed by a combination of commercial and public money – owing to the unique way that the BBC is funded.

The FCC has considerable experience with realigning U.S. spectrum resources. Coupled with the U.S. experience, as has been noted in the captioned docket,[1] the European repacking experience may inform the planned broadcaster repack. We certainly believe the lessons Transmit learned in the European process should be considered as part of the debate about repacking rules in the U.S.

I. Transmit

Transmit is a team of broadcast TV experts, including business and technical expertise, headquartered in London and in the San Francisco, California area. Transmit specializes in spectrum repacking projects, and has consulted in broadcast repacking projects across Europe, including projects like the FCC's upcoming incentive auctions. Transmit consults on and delivers big transformational broadcast projects: our genesis is spectrum repacking.

Together – working with broadcasters, the Government, the regulator, network providers and other Stakeholders – our consultants coordinated the end to end broadcast re-engineering program for two spectrum repacks in the UK to industry and political acclaim, under budget and on-time: leading unprecedented industry collaboration. In addition, our consultants have experience of broadcast TV networks and repacking projects in Australia, Serbia and Ireland. Transmit is currently consulting with broadcasters on the 3rd European repack resulting from the pending clearance (from Broadcasting) of the 700MHz band, due to be confirmed at the World Radio Conference in 2015.

Transmit consultants have launched end-to-end broadcast TV networks, pioneering digital terrestrial TV (DTT) and HD broadcasting globally. Our consultants have launched and operated broadcaster shared multiplexes; set-up and managed the technical operations of both TV stations and broadcast TV platforms. Together we are experts in one of the most complex broadcast TV networks in the world.

Transmit is pleased to bring its experience to inform the Commission's approach to the challenges and opportunities of the U.S. spectrum repack with an open and objective perspective.

II. The challenges and opportunities of the U.S. spectrum repack

The spectrum repack presents broadcasters and stakeholders with a number of opportunities and challenges. These opportunities and challenges must be at the forefront when the Commission considers which costs are "reasonable" for reimbursement and how costs can be reduced and innovatively mitigated. The opportunities and challenges include:

1. To release spectrum to the successful bidders/mobile carriers in a transparent and planned manner that minimizes the time it takes the new service licensees to launch new services to market, and the Government to collect auction revenues.

[1] See Letter from Rebecca Thompson-Murphy, Competitive Carriers Association, to Marlene Dortch, Secretary, FCC, September 4, 2013, and Letter from Jonathan Spalter, Chairman, Mobile Future, to Marlene Dortch, Secretary, FCC, July 31, 2013.

2. To provide an environment in which participating broadcasters have confidence to work together to plan and implement the repack and to explore opportunities for sharing spectrum, creating a positive precedent for future spectrum efficiency.

3. To communicate effectively with American viewers so that they will understand the benefits of repacking and the steps viewers must take to continue viewing their favorite programming.

4. To enable participating broadcasters to efficiently plan and reengineer their networks in a robust and "like for like" manner with comparable coverage.

5. To minimize costly transition time while ensuring that participating broadcasters can remain on-air when complex national and international spectrum-use inter-dependencies are at play.

6. To ensure that the engineering and equipment supply-chain (with scarce resources) can successfully meet the needs of and deliver the repack nationally within the three-year transition period.

7. To ensure that the $1.75 billion TV Broadcaster Relocation Fund to reimburse participating broadcasters for "reasonable costs" is sufficient, and that it is subject to appropriate accounting safeguards.

III. Guiding principles to respond to the challenges and opportunities of the repack

1. Industry collaboration and coordination must be built on a consensus basis.

Broadcaster collaboration and coordination can be valuable in developing innovative ways to save program costs, optimize the use of scare resources and deliver pragmatic solutions. A mechanism designed to facilitate, at an industry level, broadcaster collaboration and coordination to deliver a repack can greatly increase the chances of program success but ideally it should emerge from the broadcaster players themselves. While such a mechanism for fostering industry collaboration and coordination requires unequivocal government and regulator support and industry engagement can be formalized in licenses, the guidance for the structure of such a mechanism cannot be too prescriptive. For example, one such mechanism might be the establishment of a single-purpose delivery organization with just the "framework" set by the Commission. For an industry to begin to collaborate and coordinate itself, it must be enabled to design itself how it does this. It is critical that the broadcast industry be given every opportunity to minimize the impact of what is essentially a disruptive event on their businesses and that participating broadcasters are enabled to approach delivering a project with a public purpose in a business minded and commercially astute manner.

2. A phased and coordinated spectrum planning and broadcast reengineering approach can greatly facilitate broadcast transmission continuity and protect station coverage through the transition.

A phased and coordinated planning approach increases confidence in the relocation process, projected costs, and the program, generally. The complexity and limitations of the repack also mean that a phased approach might be the only way to compete repacking within the three year transition period, given that spectrum and resources are scarce, and spectrum interdependencies complex. Planning enables engineering and spectrum management based tools to be used to ensure seamless on-air transition with consistent coverage during the transition. Planning also minimizes the time participating broadcasters spend in expensive transitional states, and allows participating broadcasters to proactively manage and mitigate any impact to a station's post-transition coverage. Central planning significantly decreases resources, cost and elapsed time required across the whole project.

3. **A phased broadcast reengineering approach can expedite the launch of new mobile services in critical markets.**

A phased and centrally planned national approach can effectively enable the TV industry, some broadcasters and some difficult areas (e.g., areas along the borders of Canada and Mexico) more time while repacking in priority areas is expedited. In the U.S. 800 MHz reband, the Commission ordered the reband to proceed in multiple geographical areas in parallel when international relations, engineering and interference inter-dependencies allowed. Central management of a phased approach will enable a smooth transition.

4. **A realistic and iterative approach to engineering planning is critical to successful implementation of a repack program.**

Reengineering broadcast TV networks is a multi-dimensional puzzle with complex interdependencies. Technical decisions made by one participating broadcaster can impact multiple other decision points and broadcasters. As a result unified high-level, over-arching spectrum and engineering design/planning needs to be iterative with continuous feedback loops to ensure the most robust broadcast solutions are reached and the rollout timetable is optimized. It is critical for the success of the reengineering program that limitations are accepted and factored into the planning process (i.e., bad weather, difficult geographical terrain, limited technical resources) building in upfront contingency.

5. **A clear, attainable, and secure public timetable is critical so that the viewing public can have confidence in the process.**

A centrally managed, large-scale phased program with multiple dependencies should only announce dates to the public when work is sufficiently far advanced to give confidence that those dates can be met. An emerging date announcement process can also be used to alert the viewing public to the date and time on which their viewing habits may be impacted. In addition, the management of technical and communications plans in parallel can greatly facilitate the accurate and timely communication of technical changes and can even be used to drive spectrum planners and engineers to minimize viewer impact in their planning.

6. **Predetermined engineering principles foster clear collaboration, save costs and expedite repack implementation.**

A principles-based approach can be used to attain industry clarity and consensus on key technical matters, making clear options available to participating broadcasters and providing transparency to the decision-making processes when the repack is under way. It is critical that participating broadcasters are involved in and engaged with the design of the governing principles. Such an approach can greatly ease the management of the TV Broadcaster Relocation Fund and expedite the repack implementation. In this way, the volume of technical principles open to debate is contained and participating broadcasters may work within a set of network re-planning principles and tools to gain confidence that the costs associated with their approach with be reimbursed. For example, principles might cover how spectrum is allocated to participating broadcasters in markets, the criteria for replacing and/or modifying antennas, processes for exchanging spectrum between stations, engineering techniques (that are reimbursable) for regaining coverage lost as a result of the repack.

7. **A bespoke point of authority online resource for managing the repack engineering program is critical to ease the design, planning and implementation of a high-scale and extremely challenging project.**

In the spectrum realignment processes the FCC undertook in the recent past, it delegated responsibility for management of the realignment to a central manager: In the U.S. 800 MHz reband, the Transition Administrator managed the transition. In the deployment of PCS, the Spectrum Clearinghouse, managed by PCIA, worked with all involved licensees to relocate the incumbent microwave facilities to clear the band for deployment of PCS. To centrally manage an engineering repack program of this scale across multiple participating broadcasters requires the smart use of technology to facilitate a transparent and shared understanding of the process. A secure online resource (with the required access and user controls) can be used to manage, for example, the status of spectrum allocations and use, iterations of band-plans and repack roll-out plans, engineering workflow and interdependencies between broadcasters, cost reimbursement applications and sign-offs. Critically, as a point of authority program resource multiple stakeholders can remain across the project as they require to different degrees of detail, dramatically decreasing the project management drain and cost across all stakeholders.

8. **Clear principles for cost reimbursement are critical to the success of the repack.**

Setting clear principles for cost reimbursement in advance of the start of the project is critical since otherwise participating broadcasters are unlikely to commit to the plan. Ideally, these should be based on best practice engineering and project management principles with each participating broadcaster being awarded a budget for its part in the program and robust reconciliation and accountability to ensure proper control of expenditure of public funds.

9. **A repack program that facilitates industry innovation and minimizes ongoing viewer impact would create opportunities to promote a strong future for broadcast TV.**

The repack program presents an opportunity for broadcasters to consider the adoption of innovations in the way that they use spectrum. Such innovations can promote spectrum efficiency while at the same time creating opportunities for broadcasters to launch new services

thereby underpinning the future of the terrestrial television platform. Reimbursement policies should be sufficiently flexible to sort out reimbursable costs and allow a participating broadcaster to apply the reimbursements to upgraded facilities.

IV. Guiding principles for TV Broadcaster Relocation Fund administration

A fund to reimburse participating broadcasters using public money needs to be fit for the purpose, balancing effective governance with fair distribution. In our experience it is critical that budgets be allocated to each participating broadcaster in advance with reconciliation against actual costs at the end of the project. The alternative where monies are applied for on a granular cost-by-cost basis is far more expensive to administer and wasteful.

The following factors are critical for successful fund administration:

- Industry consensus and clear guidance on how funds are allocated to participating broadcasters in advance;
- A mechanism for public and less affluent commercial participating broadcasters to receive funds upfront to finance the relocation to avoid delays associated with scarcity of funds;
- A provision for planning funding to allow each participating broadcaster to consult with design and construction engineers to plan for the relocation and avoid costly and delaying surprises;
- A provision for "upgrades" during the relocation process, so that participating broadcasters need not expend energy on antiquated facilities, but may apply the TV Broadcaster Relocation funds to innovative facilities while relocating;
- Policy, accounting & legal requirements for fund administration that do not incur unnecessary and counter-productive costs, or cause delays;
- The "reasonable" treatment of participating broadcasters with parity across all types of broadcasters;
- Simple, pragmatic and appropriate process and procedures based on best practice engineering and project management principles;
- Direct and transparent relationships between the fund administrator and participating broadcasters;
- Pragmatic issue resolution that avoids delay, including use of mediators, as in the U.S. 800 MHz reband;
- The acceptance of trade-offs between cost and the speed of delivery;
- Clarity and agreement on how budgets are drawn-down and cash is handled;
- Transparent and consistent reporting of decision-making to the industry;
- The ability for participating broadcasters to manage change within their budget; and
- Up-front communication of true up and audit requirements and processes.

V. Hard broadcast costs, such as new equipment and tower rigging

When considering what "hard costs" are reasonable for reimbursement, it is important to appreciate that all participating broadcasters will need to be treated "reasonably" and with parity. A principles-based approach to the engineering repack program and its procurement is key to parity and is itself a cost mitigation strategy.

Having reviewed the catalog of eligible expenses described as "broadcast costs" we comment as follows. Our comments include lessons learned, engineering approaches and practical issues:

1. Examples of engineering repack principles

- Criteria for minimizing the disruptive harm to broadcasters e.g. there will be no material adverse consequence to existing broadcast infrastructure; broadcasters shall bear no reasonably incurred cost to accomplish the relocation;
- Criteria for minimizing any disruptive impact on the TV viewing public e.g. how and when switching breaks, outages and events requiring the viewer to rescan are handled and communicated;
- How channels are allocated to participating broadcasters, and how exceptions are handled when complex spectrum interactions require allocations to be revisited;
- The definition of TV coverage areas and how each is protected for different reception devices i.e. roof-top aerials, set-up aerials and nomadic devices;
- The criteria for replacing and/or modifying antennas;
- How international requirements are handled;
- The criteria for replacing or retuning transmitters;
- The process for exchanging spectrum between stations;
- Band-edge handling to guard against interference with mobile use;
- The policy for transitional broadcast states which impact adjacent stations;
- How spectrum being released to successful bidders/mobile carriers might be temporarily used to ease and advance the repack program;
- Engineering techniques for regaining coverage lost as a result of the repack; and
- The requirements for technical documentation (in this case principles may become templates).

2. Examples of engineering techniques to mitigate costs

- **Reassigning channels using a 2-step frequency plan reduces banding issues and lowers costs.** Proactively and consistently minimizing the number of channels each station is shifted in the repack band plan will reduce costs significantly. In the UK for the 800MHz repack, all stations on channels 61 and 62 were shifted to 48 to 53, and some stations using channels 48 to 53 were shifted to 39 to 40. The benefits of a two-step repack are the less channels a station moves the more likely its antenna can be modified and still meet coverage objectives; the more likely and less expensive it is to retune the transmitter. In addition, domestic

aerial groups were respected eradicating the need for any consumer to change their rooftop aerial. A two-step repack does require central coordination of planning and implementation. The lower spectrum shifts must happen first so that the upper shift is possible – this is simply not possible unless participating broadcasters are working together in a collaborative and coordinated -- centrally managed -- way.

- **Using and sharing transportable transmitters can reduce costs and waste while keeping participating broadcasters on-air during the repack.** A transportable transmitter is a transmitter (or set of transmitters) in a container that can be moved around the country.[2] Transportable transmitters can be used to take the existing permanent transmitter(s) out of circuit; existing broadcasts use the containerized transmitters which are outside (often in the car park) while the existing transmitters - inside - are replaced or retuned ready for the repack. Using containerized transmitters keeps participating broadcasters on-air during the repack engineering while also eliminating the need for building works to accommodate transitional transmitters. In the UK for the 800Mhz repack these transportable transmitters were re-used and shared between broadcasters. To enable these cost savings to be made the implementation plan must be centrally coordinated and phased. Sharing transmitters to enable the re-use of transitional equipment does require collaboration and coordination between broadcasters. Transportable transmitters could be shared nationally, regionally and/or within broadcast corporations. The greater the coordination and sharing of transitional equipment the greater the savings and the lower the waste.

- **Using extra port combiners can reduce costs and waste whilst keeping participating broadcasters on-air during the repack.** Adding ports to combiners removes the need for combiner replacement but allows preparatory infrastructure work to begin earlier and preserves continuity of service during the repack as the existing permanent combiner does not need to be retuned or replaced.

3. Scarce engineering resource

It is widely appreciated that rigging resource is scarce and that this scarcity will impact the repack. From our experience, transmitter retuning experts, combiner retuning experts and helicopter pilots qualified to replace antennas will also be scarce. For example, transmitters will often need to be retuned by experts from the manufacturer. Broadcasters may be dependent on limited manufacturer resourcing. A phased and coordinated repack can respond to and better manage the scarcity of expert engineering resource, controlling costs and ensuring that already valuable resource is not wasted.

Through its global presence, Transmit can bring greater resources to the U.S. from its native territories to accomplish repacking in a timely fashion.

[2] Sprint Nextel accomplished rebanding at 800 MHz in the U.S. with a similar approach.

4. **Managing external stakeholders to save time and mitigate costs**

- **Radio and mobile operators:** Proactive and early engagement with the radio and mobile industry is essential. It cannot be assumed a mobile operator will cooperate throughout the repack reengineering simply because it is a successful bidder who will gain spectrum from the repack. Nor can it be assumed that a radio station, even if owned by the same broadcast corporation as the TV station on the tower, will cooperate. In the UK for both repacks we engaged early and consistently with both the radio and mobile industries agreeing principles for impact to their services as a result of reengineering works. Importantly, this approach also ensured that requests for compensation for interruptions to service and/or coverage impact during the repack reengineering gained no traction, having been managed by agreeing upfront principles between the affected parties and the central manager.

5. **Additional cost categories and cost distinctions**

- **On-going incremental operational costs:** Broadcasters should be reimbursed for any ongoing incremental operational costs as a result of repack infrastructure changes; this category should be added to the catalog. One example of incremental operational costs is the additional electricity costs associated with moving to a higher-powered transmitter. In order to avoid a never-ending compensation program, the principles for applying a lump sum payment for ongoing incremental operational costs should be agreed in advance.
- **New towers, modifying existing towers and temporary towers:** While the catalog considers tower height, the type of modification (i.e. minor, major or serious) and suggests a price per foot approach to estimates, there is no mention of different types of tower structures or difficult structures, or difficult landlords. There must be the latitude to accept differentiation pricing for different types of structure and difficult structures or unyielding landlords demanding a king's ransom for the transition. Temporary towers should also be added to the catalog. While it is expected to be the exception, temporary towers can be required to take live systems during the transition if the structure of the existing tower requires significant work.
- **Redundancy states and equipment:** The catalog does not reference redundancy systems. Back-up infrastructure used to keep broadcasts on-air when there is a fault on the live system will also need to re-engineered – as the live system – for the repack: these costs are reasonable and should be eligible for reimbursement.
- **Renting antennas and transmission equipment:** In the UK, looking at global-supply options, we found no existing market for renting transmission equipment and we could not create one. If transportable transmitters were re-used nationally, working together as an industry with suppliers, it may be possible to create a set of antennas and transmission equipment available in a rental market, but this is speculation at this stage.

- **Disposal of legacy equipment:** With central management of the repack, legacy equipment may be used in the transition of later repacked stations. After the equipment is so used, in our experience, there is no real market for legacy broadcast equipment. As a result it should be assumed that equipment taken out of service by the repack must be scrapped and treated as a reimbursable cost. In limited cases, the existence of a central coordinating body could help to identify opportunities to re-use some equipment.
- **Mitigating and managing interference from other stations:** Interference from a TV station to another TV station as a result of the repack will need to be managed and mitigated. Interference mitigation should be a separate cost category. Mitigating interference from other stations will generate additional engineering costs - for example, power levels might need to be changed, filters added or antennas might require modification. Costs to manage interference between TV stations can be decreased by agreeing up front the principles by which engineering techniques can and should be used. In addition, early recognition and mitigation of coverage issues caused by the repack will create a more robust solution and in the long term be cheaper. Designing antenna and transmission systems to mitigate interference requires an iterative and coordinated planning approach because by definition it is all about interdependencies.

6. Procurement and cost mitigation

- **Industry bulk discounts through framework agreements:** Bulk discounts can be achieved by centrally negotiated framework agreements. In the UK for the Digital TV Switchover repack, framework agreements were negotiated for all transmission sites with the main suppliers of transmitters, combiners and antennas based on aggregated predicted demand. This then allowed individual companies to draw down individual items at the discounted and locked in price. This approach also enabled broadcasters to benefit from product developments during the time of the repack; if the manufacturers increased a product's specification but it remained the only piece of kit to meet a particular requirement the price was held.
- **Incentivizing cost savings:** In other countries the monies saved through cost saving activities have been shared with broadcasters through gain share mechanisms.

7. Repack communications

In the catalog "Develop and air announcement of upcoming channel change" is listed as an "other" broadcast cost, communications must be its own cost category. We suggest that this underpins the potential role of effective communications which are essential to a smooth transition. This is particularly true with respect to:

- The TV viewing public;
- Schools, hospitals, housing providers;

- TV equipment trade – manufacturers, retailers, aerial installers;
- Local & National media;
- Charities and outreach; and
- Local, state and federal government.

How the impact of the repack to the viewer is communicated and handled is critical for a politically successful repack and for a strong future for broadcast terrestrial TV. It is also important to establish and agree – as an Industry – upfront the critical success factors for the repack. Centrally coordinating communications ensures appropriate, consistent and simple messaging across the country and delivery against critical success factors. The benefits of Industry coordination include:

- Maximizing the benefit to the public by meeting the spectrum goals in a timely manner;
- Minimizing any disruptive impact on the TV-viewing public and harm to participating broadcasters;
- Reducing relocation costs through efficient management; and
- Avoiding waste, fraud, and abuse.

During the repack viewer experiences can be:

- No change at all (when the viewer is in a market unaffected by the repack);
- Disruption to TV services during re-engineering work;
- Temporary loss or gain of TV services owing to temporary interference from other stations;
- Permanent loss or gain or TV services as a result of constricted coverage areas or owing to permanent interference from other stations; and
- The need to rescan TV receivers to continue to receive TV services when services move spectrum.

Repack communications to the viewer should include but not be limited to on-air announcements. Other means of communicating with the viewer might include on-screen messages (messages inserted into the transmission stream), press advertising, radio advertising, billboards; information on a station's website; social media; web advertising; billboards; public relations; and leaflets. In addition, mechanisms must be put in place for participating broadcasters to be reimbursed costs associated with handling viewer, press, and political inquiries about the repack.

In the UK for both the Digital TV Switchover and 800MHz repack, a coverage and date checker website was produced which became key to all viewer communications. This website enabled a viewer to enter his or her address to find information regarding the TV services they were predicted to receive before, during and after the repack. This website also told viewers the dates they would need to rescan their TV reception equipment, as well general information regarding the repack. Such a website is particularly effective at communicating with viewers when a repack is phased; different stations in the same area require viewers to rescan on

different dates and when viewers are impacted in different ways by a repack – requiring different messages.

VI. Soft costs, professional services such as legal and engineering

When considering what "soft costs" are reasonable for reimbursement, it is important to appreciate that a repack and the reassignment of broadcasts to new spectrum will have far reaching impact across a broadcast company's business. It is extremely difficult to ring-fence the planning and delivery of a repack as a project within a company whose business is to broadcast. Broadcasters will need to assess, mitigate and manage the impact of a repack across – for example - existing contracts, business as usual processes and procedures, programming schedules and significant broadcast events, and the strategic cost of resources not doing something else – this will require effort and decision making through most management levels.

Having reviewed the catalog of eligible expenses described as "professional services" we comment as follows, we are commenting about resourcing in general:

1. Internal resources

The catalog makes no provision for the use of internal resources. In the U.S. 800 MHz reband, internal resources were reimbursed at demonstrated cost plus a benefit load. In this repack, where internal resources are deployed in furtherance of the repack, participating broadcasters should receive reimbursement for those costs. The alternative is that participating broadcasters will be incentivized to use potentially more expensive external resource.

2. Economies of scale within participating broadcasters

Incentivizing participating broadcasters to co-ordinate repacking across many stations could introduce further cost savings; this would enable expertise and experience to be shared and economies of scale accessed. That said, one size will not fit all. The geographical distribution of stations and/or the corporate governance structure within a company will determine how best to share resources across stations to decrease costs.

3. Attorneys, accountants and management resource

In the U.S. 800 MHz reband, the cost of outside attorneys was reimbursed for any task reasonably necessary to the reband. Negotiations, both of the overall cost of the reband and the agreements with the vendors, tower owners and engineers participating in the reband, strategic counseling, and application preparation, were all reimbursable. Participating broadcasters should be supported as well as the 800 MHz licensees subjected to rebanding in the U.S. In addition to attorneys, participating broadcasters should be able to call upon any reasonably necessary professional advice to manage the repacking process. Adequate guidance from able advocates will ensure proper planning and effective execution of the repacking process.

In addition, general business resources -- attorneys, accountants -- will be required to manage a broadcast company's relationship with the fund administrator – protecting the

company's interests and ensuring compliance with reimbursement policy and procedures. It is critical that the reimbursement policies and procedures of fund administration themselves do not diminish the participating broadcaster's confidence in the process, slowing repacking and creating unnecessary and disproportionate delays in the ultimate realignment of the spectrum.

4. Project management

The catalog references project management as an "if needed" and "other" resource type. Based on its experience, Transmit strongly recommends that project management be allocated as a specific cost category for reimbursement. Project managers bring discipline and order to the chaos of the project. Without promoting a strong ethic of best practice project management across all organizations responsible for delivering a repack from the outset it will be difficult to manage costs with the objective of minimizing them, problematic to minimize the impact on participating broadcasters and viewers, and challenging to meet spectrum release objectives in a timely manner. Project set-up should also be a reimbursable cost; participating broadcasters should be encouraged to allocate time and effort to ensure the on-going effective management of the repack.

5. Engineering resource

The catalog lists only engineering costs for upfront 'studies" and the preparation of forms (301, 302 and special temporary authorization). Expert engineering resource (including spectrum planning) will be required through every part of the end-to-end broadcast chain. There will be a cost associated with requirements scoping, designing, specifying and planning for each hard equipment cost but also how each element fits into and affects the complete broadcast chain. It is simply not possible to consider parts of the broadcast infrastructure in isolation: broadcast infrastructure must be treated as a system.

In addition, it must also be appreciated that owing to the complex and iterative nature of repack engineering, resource costs for engineering will be incurred as system designs and implementation plans emerge and are refined, especially when interactions and interdependencies exist between spectrum and stations.

It is possible to better understand and then manage the cost of expert engineers by agreeing – through industry consensus – to frameworks by which the engineering repack will be planned, scoped, designed, specified, implemented and project managed.

VII. Promoting a strong future for broadcast terrestrial TV

To provide an environment in which broadcasters have confidence to work together to implement the repack and explore the opportunities for sharing towers, antennas – even multiplexes and spectrum – it is critical to guarantee and promote a strong future for broadcast terrestrial TV.

The global trend is to squeeze broadcast use of spectrum and exert pressure for greater spectrum efficiency across all users. These factors are inevitable and it is time to consider how

broadcasters can share towers, antennas multiplexes and spectrum – to be fit to ensure the on-going use of spectrum for broadcasting. Worldwide experience shows that broadcasters can successfully share these resources and confidence should be gained from understanding the models that exist. However, it must be appreciated that this begins to open some big strategic questions for the broadcast industry.

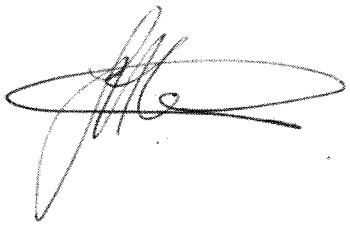
The answers to these questions may become clearer as this proceeding progresses. It is clear, however, that the repacking process must be centrally-managed to be fair and effective. Costs reasonably related to repacking must be reimbursed, and the process must be managed to minimize the impact on the viewing public.

Project management of a program of the size of the broadcast station repack benefit from central management aligning all involved organizations. A central framework can deliver a consensus driven, simple, fair design, flexible enough to enable a broadcaster to adapt without disruption to its business.

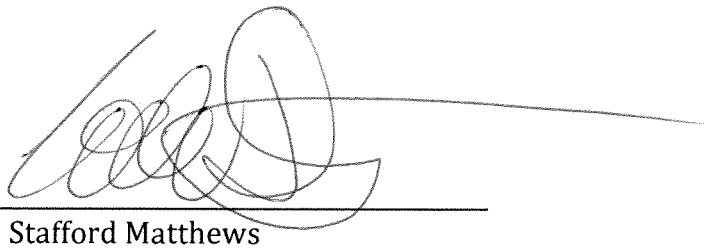
Transmit urges the Commission to adopt a structure for repacking that is controlled by a central manager, ensuring uniform processes and parity among broadcasters.

Respectfully submitted,

TRANSMIT CONSULTANCY LTD.



Jules Howard-Wright
Chief Executive

By: 

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November 4, 2013

Appendix 1: Transmit management team

Jules Howard-Wright, Principal Consultant & Co-Founder

From 2006 to 2012 Jules was Broadcast Project Director at Digital UK for the Digital TV Switchover and 800MHz repacking programs. As Broadcast Project Director, she managed the technical planning, co-ordination and stakeholder management for the re-engineering of the entire UK television transmission network. During 2011 and 2012, Jules also led the technical operations and development of the UK's terrestrial platform Freeview on behalf of multiplex operators.

Jules has worked in broadcasting at an industry level for close to 15 years and has delivered technical projects (TV, internet and mobile) her whole career. Her career started at a digital communications agency (now Digitas LBi), after which Jules spent a year with a New York dot.com. As a Commercial Manager at a broadcast production house, she managed licenses delivering satellite and cable projects in the UK, U.S., Israel and Australia. In 2004, Jules started her first consultancy; her first client was BSkyB where she led the team responsible for launching all broadcasters' interactive services on the Sky platform.

In 2012 – for her work on UK repacking - Jules was a Women of the Year Finalist in the Cisco everywoman in Technology Awards.

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Mike Hughes, Principal Consultant & Co-Founder

From 2005 to 2012 Mike was Broadcast Director at Digital UK for the Digital TV Switchover and 800MHz repacking programs. As Broadcast Director, he led the technical planning, co-ordination and stakeholder management for the re-engineering of the entire UK television transmission network. Mike continues to consult to Digital UK through Transmit.

From 1997 to May 2013, Mike was General Manager of Digital 3and4, a multiplex license holder and a joint venture between ITV and Channel 4. He played a key role in the launch of UK's terrestrial platform Freeview (and its predecessor OnDigital), for many years he chaired the Board responsible for the technical strategy and operations of this platform.

He started his career in industry relations working for the Independent Television Companies Association in the UK and then the Australian Broadcasting Commission in Sydney. He returned to the UK to Anglia Television (part of ITV) rising to Deputy CEO. In 1995, Mike formed his first broadcast consultancy; his first major client was Channel 5 where he acted as Project Co-ordination Director for launch. He is currently a Non-Executive Director for Mustard TV, the local TV license holder in the UK.

Contact details: +44 780 215 1759, mike@transmitconsultancy.tv

Mark Evans, Lead Technical Consultant

From 2005 to mid- 2013, Mark was the lead Technical Consultant at Digital UK for the Digital TV Switchover and 800MHz repacking programs. Mark is a transmission, spectrum management and TV reception expert. Mark continues to consult to Digital UK.

Mark played a key role in the development and implementation of DTT from 1997, including the negotiation of the transmission contract, and subsequently was a key member of the Freeview launch team in 2002.

Mark has worked in broadcasting for 28 years and provided industry level technical leadership in digital broadcasting since the very beginning. Mark started his career in the BBC's engineering division, project managing the procurement and installation of Long, Medium and Short Wave transmitters and antenna systems in the UK and overseas. He subsequently installed the world's first digital radio network, starting with the research pilot in 1993 followed by the operational network in 1995.

Mark remained with the BBC when BBC Transmission was privatized, establishing and leading the team responsible for managing all the contracts for delivering the BBC's services, both radio and television, over terrestrial, satellite and cable, rising to Head of Technology for Distribution with responsibility for all of the delivery of the BBC's services from transmission to reception.

Mark's current areas of particular interest are the potential impact of 4G roll-out, White Space and Dynamic Spectrum Access initiatives on DTT reception.